THE WEATHER ELEMENTS

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PRESSURE AND WINDS

Changes in barometric pressure were frequent, but the cyclones and anticyclones usually lacked important proportions, the cyclones in particular often appearing quickly, moving over short and occasionally erratic paths, developing unforeseen energy for brief periods, and dissipating unexpectedly. Good illustrations of these tendencies appear on the daily weather maps for the first few days of the month.

On the morning of the 1st a slight cyclonic formation appeared over North Carolina. As this depression moved northward along the coast it developed marked intensity, reaching eastern New England on the morning of the 2d as a storm of great severity, though of rather small extent, and bringing high winds and thunderstorms along the coast and unusually heavy snowfall from Maryland and Delaware northeastward, the depth of fall ranging up to 15 inches or more.

Again on the night of the 6th–7th a storm developed over the Middle Atlantic States and by 8 a. m. of the 7th was central over southern New England as a cyclone of marked intensity, attended by high winds, heavy rains, and material snowfall, particularly in northern new England. This storm maintained its severe character for a somewhat longer period than did the one just preceding, but it also quickly dissipated after the 8th.

Another storm of somewhat erratic character, particularly as to its unusual northward movement, first appeared on the morning of the 14th over Wyoming and 24 hours later had advanced to northern Colorado, with a sharp fall in pressure over the middle Plains region. By the morning of the 16th the center had advanced to the Dakotas and Minnesota, and general rains or snows had occurred over wide areas between the Great Lakes and Rocky Mountains. Within the following 48 hours it moved to the northward of Lake Superior.

On the morning of the 18th a trough of low pressure extended from the lower Lakes to the Gulf coast, attended by general and frequently heavy rains. This depression developed into a cyclone of considerable proportions and had moved to eastern Massachusetts by the following morning, the heavy rains extending into the Northeastern States. Generally speaking, this storm gave the heaviest precipitation of the month over a large area from the Middle Gulf States northeastward to New England.

On the morning of the 24th a rather extensive cyclonic storm had advanced into the middle Plains, but with little precipitation up to that time, save for light rains and thunderstorms to the northeastward and local light snows to the westward of the principal center. During the following 24 hours high pressure, advancing from the far Northwest, appeared to have partially broken up the cyclonic formation and crowded it to the southward, while increasing pressure over the Mississippi Valley and Great Lakes prevented the usual eastward progress. As a result of this delayed movement precipitation was rather general between the Mississippi River and the Rocky Mountains, snow falling over many of the elevated districts to the westward and some heavy rains occurring over the Southern Plains. By the morning of the 26th, however, the storm had again assumed a definite formation with its center over western Iowa, but high pressure advancing southward from the vicinity of Hudson Bay still effectually hindered any eastward movement and it was finally forced to the northwestward and dissipated.

The most important cyclone of the month, from the viewpoint of damage wrought by the attending series of tornadoes, developed rather suddenly in Kansas on the morning of the 29th and is described in some detail elsewhere in this REVIEW; see page —.

Anticyclonic conditions persisted during much of the month over the north Pacific coast districts, although but few important high areas moved inland from this region sufficiently to affect the weather to eastward of the Rocky Mountains.

The most important anticyclones of the month from the Rocky Mountains eastward had their origin in the Hudson Bay region, their influence on the weather being mainly felt from the Great Lakes eastward.

The average pressure for the month was less than normal over practically all portions of the country from the Great Plains eastward, and above normal to the westward, save for a small area embracing most of California, where the average was slightly less than normal. Over the far Northwest the average pressure was distinctly high, while in the upper Mississippi Valley region it was correspondingly low.

In the absence of important pressure gradients the winds were not prominently from any particular direction, although they were mainly from the south in the middle and southern portions of the Mississippi Valley and Great Plains, and from westerly points over the Atlantic and Pacific coast States.

The principal high winds were associated with storms of the 1st and 2d and 7th and 8th, along the North Atlantic coast, and on the 29th–30th in connection with the numerous tornadoes that occurred over the Southern States on those dates. Over the Pacific coast districts no important high winds were observed.

TEMPERATURE

The first few days of the month were abnormally cold over the greater part of the country from the Rocky Mountains eastward, the morning of the 1st being particularly cold over the north-central districts where at a few points it was the coldest ever observed so late in the season, while farther south there were a number of instances where the temperatures were equal to, or nearly as low as previously observed in April.

The week ending April 8 was generally mild over all western and northwestern districts, and decidedly cool over the Southeast, the line of freezing temperature extending well into the Middle Gulf States. The week following was without important temperature changes, and was on the whole moderately warm over all interior portions. The week ending April 22, had mainly moderate temperatures, save that some unusual cold occurred during the early part in the Plateau region and about the same time it was distinctly warm in the central valleys. For the week as a whole it was generally cold over all northern and most western districts and moderately warm in the Ohio and middle Mississippi Valleys. The last week of the month had mostly moderate temperatures, although about the 24th to 26th it was cold over the northern Plateau, points in Washington having temperatures on the 24th as low as, or lower than previously reported so late in the month.

As a whole the month was warmer than normal in the central valleys and over the far Western States. It was unusually warm in northern California and the adjacent portions of Oregon, Red Bluff, Calif., reporting the

month as the warmest April of record. In the Rocky Mountain and southern Plateau districts the month was moderately cold, but elsewhere the departures above or below normal were mainly small.

The warmest periods of the month were about the middle over much of the Great Plains and thence eastward to the Ohio Valley and into portions of the Gulf States; in the early part of the last decade over many northern sections from the Great Lakes to the Dakotas and over the Rocky Mountains; and near the end of the decade over the Northeastern States and generally over the Plateau and Pacific Coast States. The highest observed temperature, 107°, was reported from Texas, and temperatures of 90° or higher were reported from most Central and Southern States.

The most important cold period of the month east of the Rocky Mountains was near the beginning; the 1st being particularly cold over the central valleys and upper Lake region, where temperatures were far below freezing, and in some instances, notably in the northern portions of Wisconsin and Michigan, were from 15° to 25° or more below zero. West of the Rocky Mountains the dates of lowest temperatures varied greatly, but were mainly after the middle of the month.

PRECIPITATION

The country as a whole had deficient precipitation, although there were important areas in the east Gulf States, and from the upper Ohio Valley and Middle Atlantic States northeastward, with monthly amounts materially above normal; in fact, over the eastern portions of Maryland, Pennsylvania, and New York, in New Jersey, and western New England the month was unusually wet, and similar conditions existed in portions of Georgia and nearby States where locally the precipitation exceeded 10 inches, and was, in some instances, among the greatest of record for April. Precipitation was above normal also in portions of Arkansas, Kansas, and Oklahoma, locally in the far Southwest, and over a considerable area from central Michigan northwestward to eastern Montana.

In portions of the middle Mississippi and lower Missouri Valleys the month's rainfall was much less than normal, and locally in Iowa it was as dry as ever known in April. Likewise in the far West there was everywhere far less than the normal precipitation, save in portions of Arizona and southern California. Over most of the States last named and thence northward there was a marked deficiency in precipitation. In California April was the seventh month with precipitation for the State as a whole below normal, and in the northern portions it was locally the driest April of record, and the drought at the end of the month had become the worst ever experienced in the history of the State.

SNOWFALL

The storm over the North Atlantic coast on the 1st and 2d brought unusually heavy snows for April from northern Virginia to New England. Indeed over much of this territory the total fall was the greatest ever known so late in spring, and locally in southern New England it was heavier than recorded at any time during the preceding winter. Again on the 7th and 8th snow fell over considerable areas in the Northeastern States, reaching depths of nearly 10 inches in northern New England; this again broke the record for heavy snow so late in the season. On the 11th some heavy snows were reported from north-central Iowa; and on the 16th and 17th considerable snow accompanied the general unsettled conditions that prevailed over the Great Plains and Rocky Mountains on these dates.

In Minnesota heavy, wet snow fell on the 21st, the depths ranging up to 10 inches or more.

In the mountains of California and adjacent States there was little new snow during the month and that on the ground melted rapidly, so that the main highways through the mountains were passable at the earliest date of record. Despite the rapid melting of the remaining snow in the mountains, streams in California were reported at summer stages. In Arizona there was a good run-off, and prospects for water were mainly good in New Mexico, Wyoming, and other portions of the Rocky Mountain system. East of the Rocky Mountains some snow still remained on the ground at the month's end in northern New England.

RELATIVE HUMIDITY

The relative amount of moisture in the atmosphere was largely deficient as compared with the normal over most far western districts, and there were important deficiencies in the interior portions of the country Elsewhere the percentages of humidity were mainly close to normal.

Much cloudy weather prevailed over the Ohio Valley and Great Lakes region and to the eastward, while over the Plateau and adjacent areas there was much sunshine.

SEVERE LOCAL HAIL AND WIND STORMS, APRIL, 1924

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the annual report of the Chief of Bureau]

Place	Date	Time	Width of path (yards)	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Justin, Tex. (near) to Edgewood, Tex. (near)	3	3 p. m.	20–100	1	$41,000	Tornado accompanied by hail.	Serious damage confined to Denton and Dallas Counties over a path 30 miles long; entire length of path 80 miles; 14 injured; loss by hail $1,500.	Official, U. S. Weather Bureau.
Fort Wayne, Ind.	8					Electrical and hail.	Telephone and light and power lines damaged.	Do
Parsons and Columbus, Kans.	8–9				$3,000–5,000	Wind and hail.	Electric-light globes, greenhouses, automobile tops, and garden truck damaged.	Do.
Lavaca County, Tex.	9		4 miles			Hail.	Storm extended from Breslau to Shiloh. Spring crops and fruit destroyed, chickens killed, and windows broken.	Do.
Uvalde, Tex. (near)	10		5 miles			do	Crops and buildings considerably damaged.	Do.
Comilla, Ga.	14	9 p. m.			3,000	Tornado	Some property damage.	Do.
New Orleans, La.	17	8 to 8:30 p. m.	6 miles		107,000	Wind and hail.	A number of small houses damaged or displaced; greenhouses and gardens injured by hail; 50 persons injured; length of path 25 miles.	Do.
Granbury, Tex.	22	6:30 p. m.				High wind	Church completely demolished, other damage to roofs and poles. Storm was preceded by violent hail which did considerable damage to windows.	Dallas Morning News (Texas).